What is claimed is:

1. A magnetoresitive sensor, comprising:

a ferromagnetic pinned layer;

a ferromagnetic free layer, including first and second ferromagnetic layers separated by a non-magnetic antiparallel coupling layer, said first and second ferromagnetic layers having magnetizations antiparallel to one another in the absence of a magnetic field and free to rotate in the presence of a magnetic field;

a non-magnetic spacer layer formed between said ferromagnetic free layer and said ferromagnetic pinned layer;

first and second leads formed above said free layer, said leads having inner terminations defining a track width and extending outward from said track width;

said pinned layer extending beyond said track width and terminating at first and second lateral sides;

a first layer of antiferromagnetic material having an inner end abutting said first lateral side of said pinned layer and extending laterally outward there from said layer of ferromagnetic material contacting a portion of said free layer outside of said track width; and

a second layer of antiferromagnetic material having an inner end abutting said second lateral side of said pinned layer and extending. laterally outward therefrom, said second layer of antiferromagnetic material contacting a portion of said free magnetic layer.

2. A magnetoresistive sensor as in claim 1 wherein;

said free layer has a center portion disposed within said track width;

said free layer has first and second outer portions beginning at first and second locations laterally disposed outside of said track width, and extending laterally outward therefrom;

said free layer has first and second intermediate portions disposed between said inner portion and said outer portions; and

said first and second layers of antiferromagnetic material are exchanged coupled with said second layer of said free layer in said first and second outer regions.

3. A magnetoresistive sensor as in claim 2, wherein said first and second layers of antiferromagnetic material are exchange coupled with said free layer from first and second locations substantially coincident with said first and second locations of said beginning of said first and second outer portions.

4. A magnetoresistive sensor as in claim 1, wherein said outer first and second outer portions begin at first and second locations spaced from said center region a distance of at least one half said track width.

5. A magnetoresistive sensor as in claim 1 wherein at least one said first and second layer of said free layer comprises refill material in said intermediate and outer regions.

6. A magnetic sensor as in claim 1, wherein said second layer of said free layer has a thickness in said intermediate and outer regions that is at least 15 percent thicker than a thickness of said second layer of said free layer in said center region.

7. A magnetic sensor as in claim 1, wherein said second layer of said free layer has a thickness in said intermediate and outer regions that is at about 20 percent greater than a thickness of said second layer of said free layer in said center region.

8. A method of constructing a magnetoresistive sensor, comprising:

forming a ferromagnetic pinned layer;

forming a nonmagnetic spacer layer;

depositing a ferromagnetic film

depositing a Ta film;

forming a mask over an active sensor area;

performing a reactive ion etch process to remove selected portions of said Ta layer;

performing an etch process to remove selected portions of said ferromagnetic film in unmasked areas; and

depositing ferromagnetic refill material in said unmasked areas.

9. A magnetoresitive sensor, comprising:

a ferromagnetic pinned layer;

a ferromagnetic free layer extending beyond a track width region, having a magnetization in a track width region that is free to rotate in the presence of a magnetic field;

a non-magnetic spacer layer formed between said ferromagnetic free layer and said ferromagnetic pinned layer;

first and second bias layers formed above said free layer exclusively in regions outside said track width region;

a nonmagnetic coupling layer sandwitched between said bias first and second bias layers and said free layer in said regions outside said track width region;

first and second leads formed over said first and second bias layers in said regions outside said track width region;

said pinned layer extending beyond said track width and terminating at first and second lateral sides;

a first layer of antiferromagnetic material having an inner end abutting said first lateral side of said pinned layer and extending laterally outward there from said layer of ferromagnetic material contacting a portion of said free layer outside of said track width; and

a second layer of antiferromagnetic material having an inner end abutting said second lateral side of said pinned layer and extending. laterally outward therefrom,

said second layer of antiferromagnetic material contacting a portion of said free magnetic layer.

10. A magnetoresistive sensor as in claim 9, wherein said free layer said track width region greater than in said first and second regions outside said trackwidth region.

11. A magnetoresisive sensor as in claim 10, wherein said free layer is at least 15 percent thicker in said regions outside said track width as it is within said track width region.

12. A magnetoresistive sensor as in claim 10, wherein said free layer is at least 20 percent thicker in said regions outside said track width region as it is within said track width region.

13. A magnetoresistive sensor, comprising:

a magnetically pinned layer terminating at first and second laterally opposed sides outside a trackwidth region;

first and second antiferromagnetic material layers abutting said first and second laterally opposed sides of said pinned layer and extending outward therefrom;

a free layer formed above said pinned layer and extending beyond said track width region;

a non-magnetic coupling layer formed over said free layer; and

a bias layer formed over said non-magnetic coupling layer, said bias layer having an oxidized, nonmagnetic, nonconductive portion within said track width region and first and second magnetic, electrically conductive portions outside said track width region.

14. A magnetoresistive sensor as in claim 13, wherein said bias layer comprises CoFe.

15. A magnetoresistive sensor as in claim 13, wherein said bias layer comprises NiFe.

16. A magnetoresistive sensor as in claim 13, further comprising first and second electrically conductive leads formed over said bias layer terminating at outer edges of said track width region and extending laterally outward therefrom.

17. A method of manufacturing a magnetoresistive sensor, comprising

depositing a magnetic free layer;

depositing a non-magnetic layer over said magnetic free layer;

depositing a magnetic bias material;

forming a mask to expose a track width region and covering first and second regions outside said track width region; and

oxidizing said magnetic bias material.

18. A magnetoresistive sensor comprising:

a first and second ferromagnetic layer;

a non-magnetic coupling layer sandwiched between said first and second ferromagnetic layers;

first and second lead layers formed over said first and second magnetic layers and having first and second inner sides thereof defining a track width, and having third and fourth outer sides disposed within a sensor region;

first and second antiferromagnetic material layers abutting said third and fourth sides of said first and second leads, and extending laterally outward therefrom beyond said sensor region; and

third and fourth leads formed over said first and second antiferromagnetic material regions.

19. A sensor as in claim 18 wherein said second ferromagnetic layer has an oxidized portion within said track width region.

20. A sensor as in claim 18 wherein said second ferromagnetic layer has an oxidized, non-magnetic, electrically non-conductive region inside said track width region.